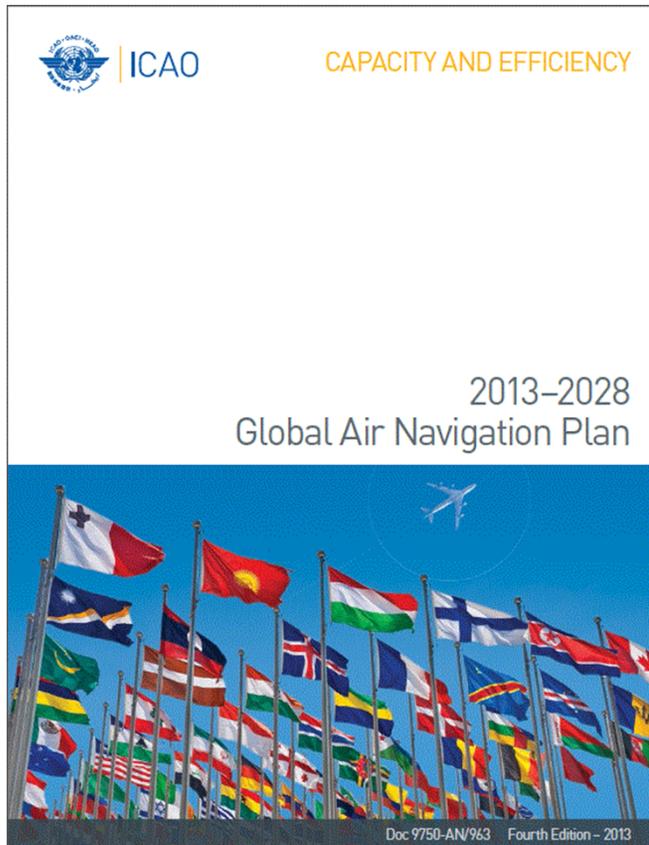# Discussion on National Air Navigation Plan

For: ASBU WS @NACC

Prepared by: Midori Tanino, ATO International NextGen Lead

Date: August, 2016

ICAO Global Air Navigation Plan

CAPACITY AND EFFICIENCY
ICAO
2013–2028
Global Air Navigation Plan
Doc 9750-AN/963   Fourth Edition – 2013

What is the GANP?

- Supports a harmonized global Air Navigation System
- It is an overarching framework
- Addresses key civil aviation policy principles
- Assists ICAO Regions and States to establish air navigation priorities for the next 15 years
- Assists ICAO Regions and States to prepare their navigation plans

FAA
Air Traffic Organization   2

Aviation System Block Upgrades (ASBU)

- Background
  - NextGen, SESAR, CARATS, and other States provide the foundation for ASBU

- GANP provides and information on:
  - ASBU framework
  - ASBU modules and associated technologies

- ASBU are designed so that:
  - Regions and States can select modules and implement based on their operational needs
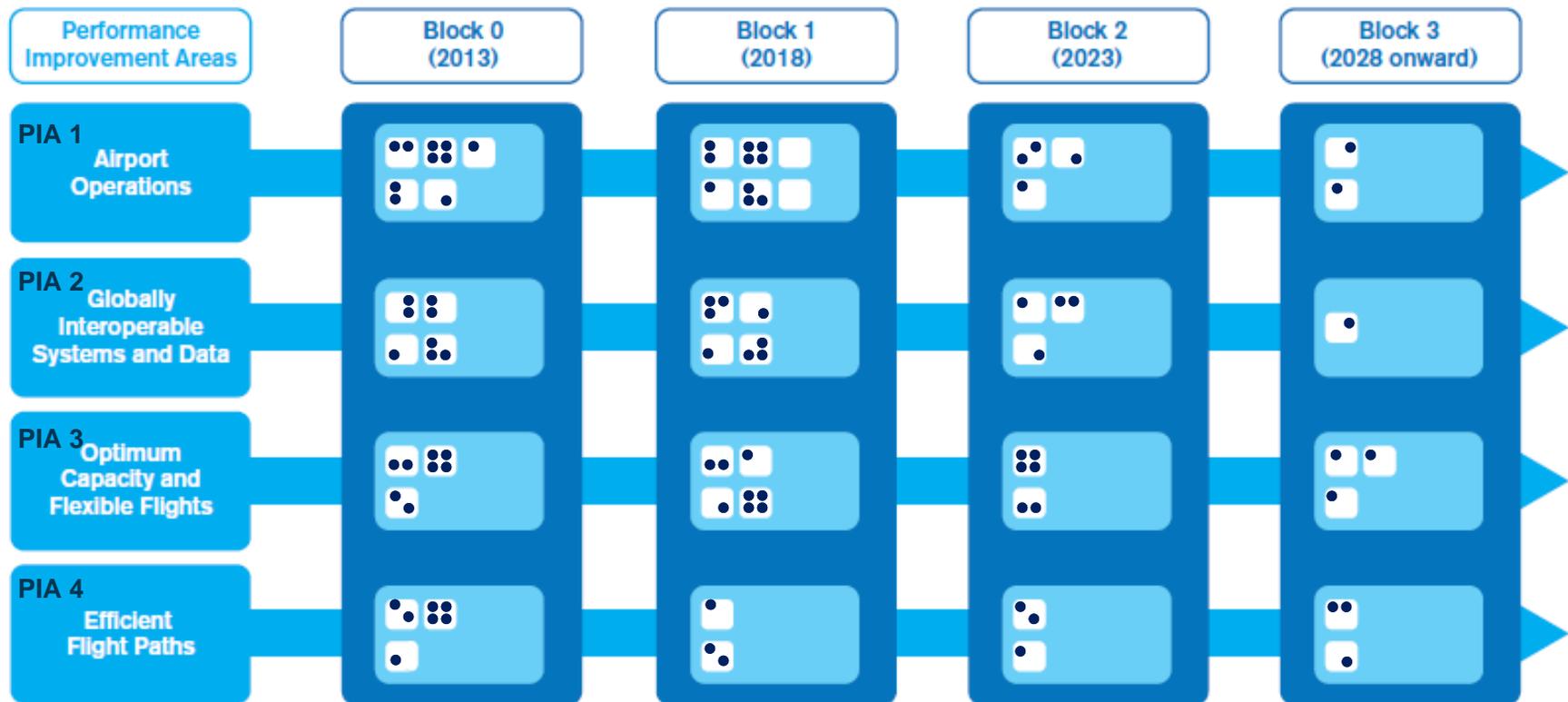 - Regions and States can implement modules according to their schedule

ASBU Structure:
## (1) Performance Improvement Areas (PIA), (2) Blocks, (3) Threads, (4) Modules
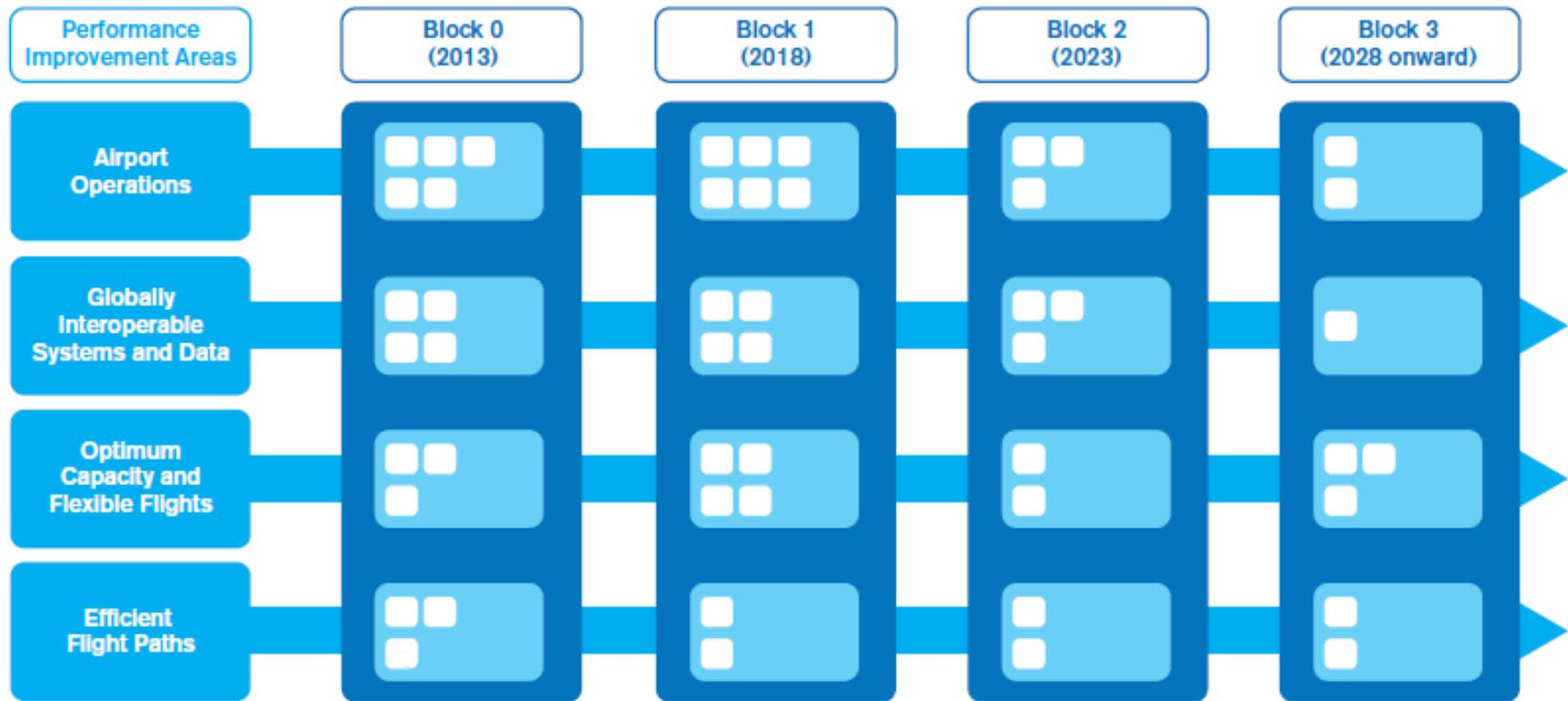
ASBU Structure: (1) Performance Improvement Areas (PIA), (2) Blocks, (3) Threads, (4) Modules, and (5) **Elements**

ICAO Regional and Member States' Air Navigation Plans (ANPs)

- Following the 12th Air Navigation Conference, a new GANP was developed and approved by the 38th Session of the ICAO Assembly in Sep/Oct 2013.

- IP *Regional Air Navigation Plan Template and Procedure for Amendment* was presented in 2014.

GANP

Regional ANPs

State ANPs
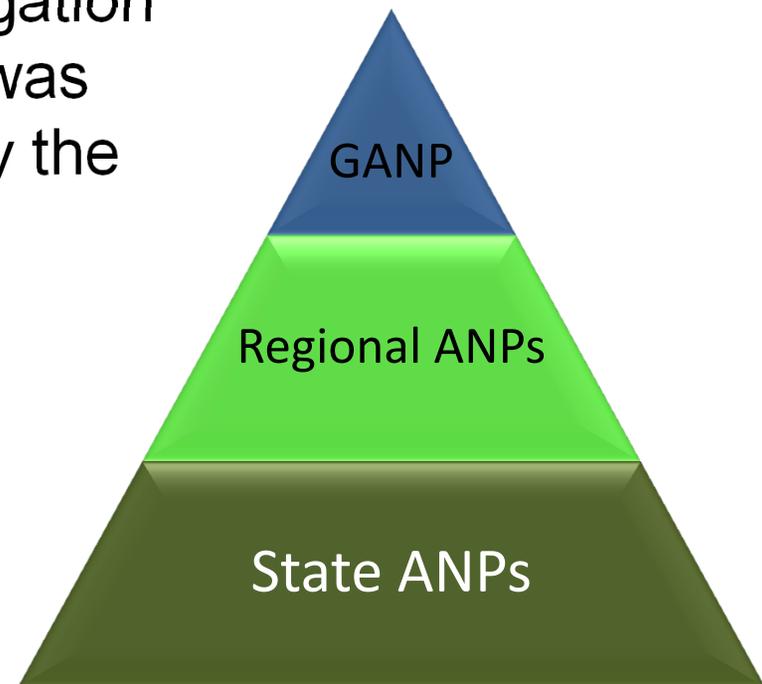
National ANP

- Do you have National ANP?
- Is your National ANP aligned with Regional ANP?
- Is your National ANP aligned with GANP?

Things to remember

- Disclaimer – not forcing any National ANP template

- Important to understand GANP/ASBU and Regional ANP to align National ANP

- Relationship between Regional ANP and National ANP (feedback each other)

Regional ANPs

New Regional Electronic ANP (eANP)

- IP *Regional Air Navigation Plan Template and Procedure for Amendment* was presented in 2014.
  - Improve access and version control by migrating the ANPs from paper-based and early electronic version into a web-based platform to facilitate easy access
  - Provide more effective amendment process
  - Align the content of the regional ANPs with the revised GANP and ASBUs
  - Remove unnecessary and duplicated information that is available elsewhere

Content of the new Regional eANP

- **Volume I** – Stable plan elements. Amendments require approval by the Council

- **Volume II** – Dynamic plan elements – amendments are approved by regional agreement

- **Volume III** – **Dynamic/flexible plan elements for implementation, planning and guidance using ASBU and technology road maps.** These elements require approval by Planning Implementation Regional Groups (PIRGs) - does not require approval by the Council

North American (NAM) ANP
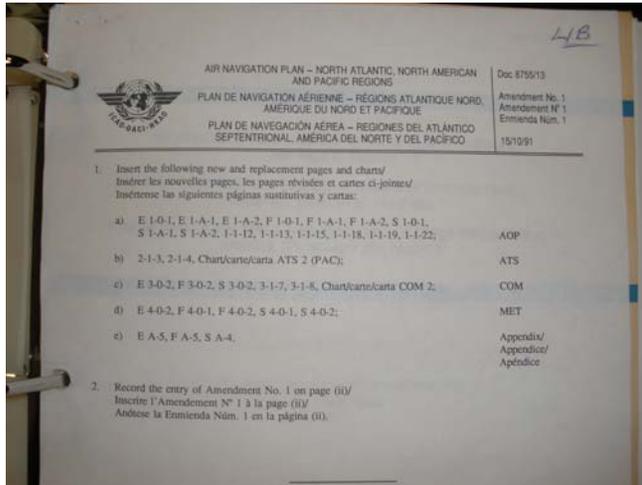
(Existing) North Atlantic, North American & Pacific Regions ANP

Complete Makeover

Part **I** General Planning Aspect

Part **II** ASBU Implementation

Part **III** Regional Aviation System Improvement Implementation

North Atlantic (NAT) ANP

NAT Service Development Roadmap
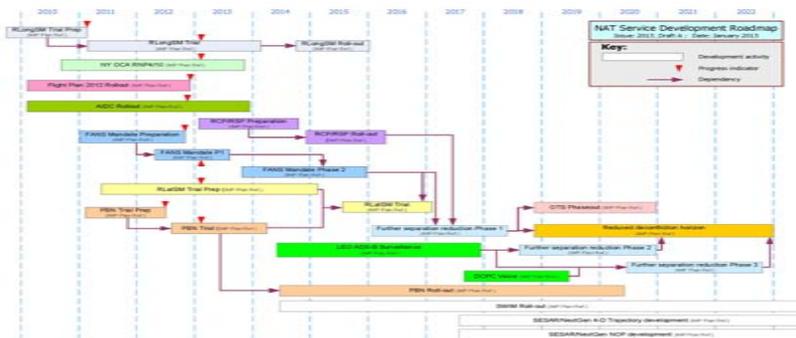
Regional Aviation System Improvement (RASI)

- Reduced Longitudinal Separation of 5 minutes between FANS equipped aircraft (RLongSM)

- Reduced Lateral Separation Minima between FANS equipped aircraft (RLatSM)

- and more…

New Structure

Part I General Planning Aspect

Part II ASBU Implementation

Part III Regional Aviation System Improvement Implementation

ICAO Plans for Asia Pacific Regions
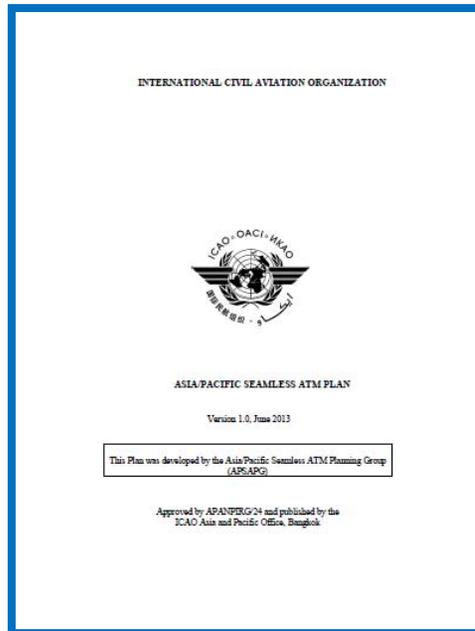
Asia/Pacific Seamless ATM Plan
Version 1.0, June 2013
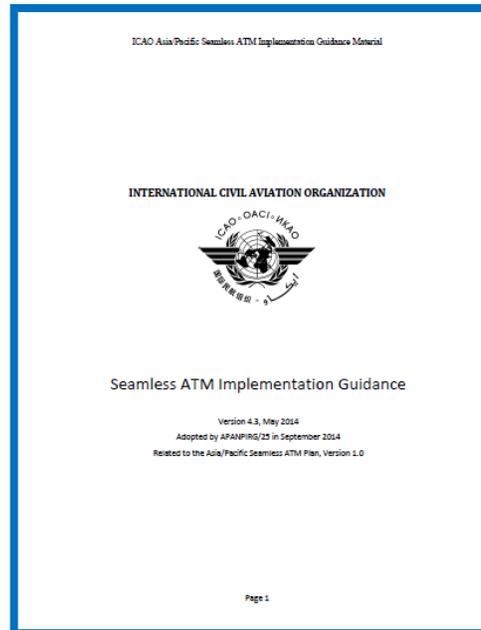
Seamless ATM Implementation Guide
Version 4.3, May 2014
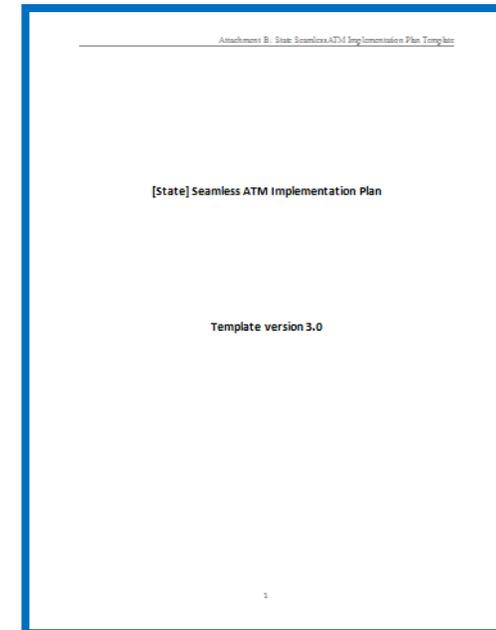
[State] Seamless ATM Implementation Plan Template
Version 3.0

Regional ANP - PBRANIP

Chapter 1 Growth and Distribution of Air Traffic in the NAM/CAR Regions

Chapter 2 Regional Performance Objectives

Chapter 3 Aviation System Block Upgrade (ASBU) Air Navigation Reporting Forms (ANRFs)

Appendix A ASBU

Appendix B Categorization of ASBU Block 0 Modules for the NAM/CAR Regions

NAM/CAR Regional Performance-Based Air Navigation Implementation Plan (RPBANIP)

National ANPs

Basic Structure/Contents

- Policy, Visions, Goals
- Supporting information such as Future Traffic Estimates
- National Requirements/Roadmap/Projects
- Relationship to ASBU and ASBU Status

ASBU – know your own needs

- Need to know your own needs
- Need to know what is in ASBU
- Need to know your work environment
  - Policy, Goal, Vision
  - Financial
  - Priority
- We will have an exercise session later in this WS

ASBU Element Analysis and Implementation Process
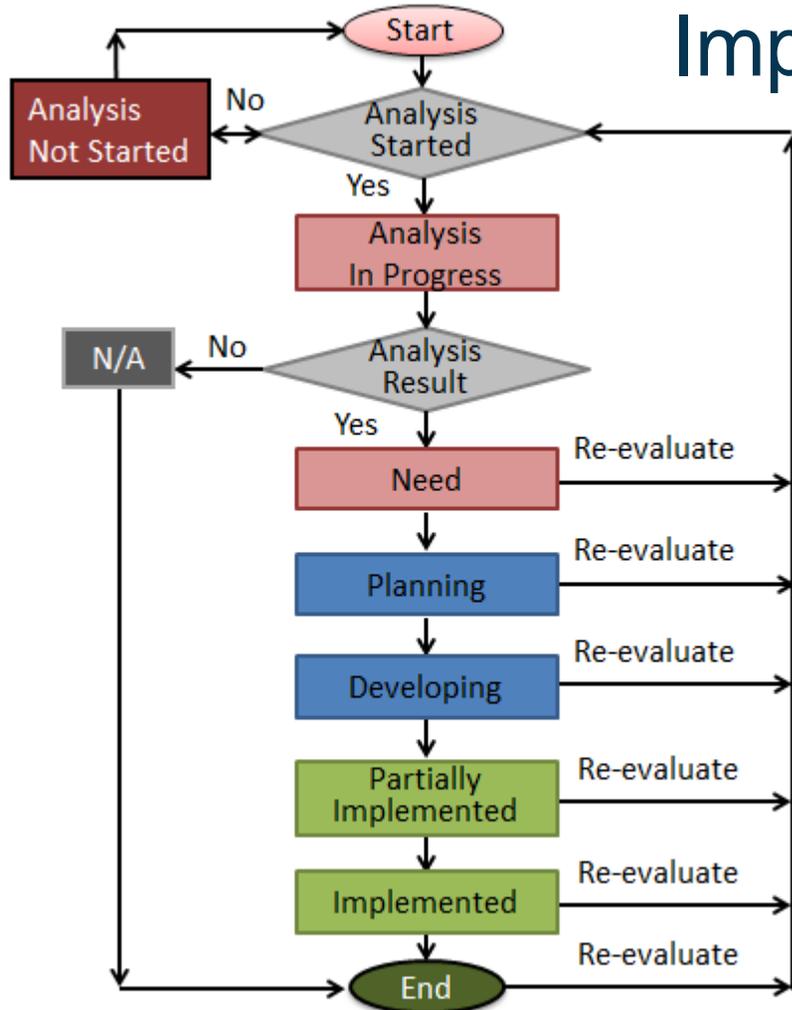
- **Evaluate Elements one by one**
  - Understand environments
  - Understand needs
  - Understand status
  - Prioritize
  - Plan accordingly
- **Reporting**
- **If fails…**
  - Analysis Not Started

ASBU – Record your status

- Evaluate Elements one by one and record the status in the ANRF

- ANRF is designed to support:
  - Planning
  - Monitoring
  - Reporting

- One ANRF per Module

Air Navigation Report Form (ANRF)

- **Purpose**
  - Report the implementation status
  - Report qualitative performance benefits
  - Provide the progress status via web viewer

- **Use the same report form for Regions and States**

- **One ANRF per module**

- **Specific focus on what will be reported**

[STATE] ASBU Air Navigation Reporting Form (ANRF)					
PIA	4	Block - Module	B0 - CDO	Date	Month Day, 2016

Module Description: Performance-based airspace and arrival procedures allowing aircraft to fly their optimum profile using continuous descent operations (CDOs). This will optimize throughput, allow fuel efficient descent profiles, and increase capacity in terminal areas.

Element Implementation Status

	Element Description: (Derived from Element 1) Procedure changes to facilitate CDO	Date Planned/Implemented	Status
1			
	Status Details		
2	Element Description: (Derived from Element 1) Route changes to facilitate CDO	Date Planned/Implemented	Status
	Status Details		
3	Element Description: (Derived from Element 2) PBN STARs	Date Planned/Implemented	Status
	Status Details		

Achieved Benefits

Access and Equity	
Capacity	
Efficiency	
Environment	
Safety	

Implementation Challenges

Ground system Implementation	
Avionics Implementation	
Procedures Availability	
Operational Approvals	

| Notes | |

Qualitative Performance Benefits

5 out of 11 KPAs are selected for the ANRF

- Access/Equity
- Capacity
- Efficiency
- Environment
- Safety

ANRF provides the qualitative benefit descriptions for each module

ICAO expects States to provide data for the chosen metrics

ASBU – Implementation Status Table

- Summarize the status into the table
  - Helps to "see" the entire status
  - Helps to report the status to Region
  - Helps to identify "troubles"

PIA 1 Block 0 Module Elements Table
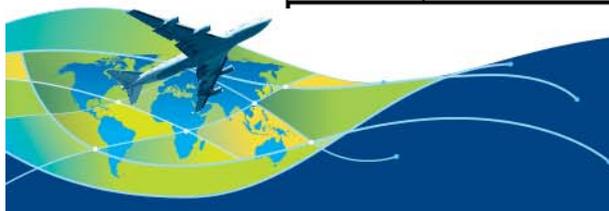(with sample checks "X")

Block 0 Modules	Module Elements	Need Analysis of Module Elements				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 1: Airport Operations									
ACDM	1. (Derived from 1.2.1 and 1.2.2) Airport CDM procedures	X							
	2. (Derived from 1.2.1 and 1.2.2) Airport CDM tools	X							
	3. (Derived from 3.1 & 7.2.1) Collaborative departure queue management	X							
APTA	1. (Derived from 4.1.1) PBN Approach Procedures with vertical guidance (LPV, LNAV/VNAV minima, using SBAS and Baro VNAV)	X							
	2. (Derived from 4.1.1) PBN Approach Procedures without vertical guidance (LP, LNAV minima; using SBAS)	X							
	3. (Derived from 1.3.2) GBAS Landing System (GLS) Approach procedures	X							
RSEQ	1. (Derived from Element 1) AMAN via controlled time of arrival to a reference fix	X							
	2. (Derived from Element 1) AMAN via controlled time of arrival at the aerodrome	X							
	3. (Defined: Element 2) Departure management	X							
	4. (Derived from Element 2) Departure flow management	X							
	5. (Defined: Element 3) Point merge	X							
SURF	1. (Derived from Element 1) A-SMGCS with at least one cooperative surface surveillance system	X							
	2. (Derived from Element 1) Including ADS-B APT as an element of A-SMGCS	X							
	3. (Derived from Element 2) A-SMGCS alerting with flight identification information	X							
	4. (Derive from 1.4.1) Airport vehicles equipped with transponders	X							
WAKE	1. (Defined: Element 1) New PANS-ATM wake turbulence categories and separation minima	X							
	2. (Derived from Element 2) Dependent diagonal paired approach procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	X							
	3. (Derived from Element 3) Wake independent departure and arrival procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	X							
	4. (Derived from Element 3) Wake turbulence mitigation for departures procedures for parallel runways with centrelines spaced less than 760 meters (2,500 feet) apart	X							
	5. (Identified by the United States) 6 wake turbulence categories and separation minima	X							

PIA 2 Block 0 Module Elements Table

(with sample checks "X")

Block 0 Modules	Module Elements	Need Analysis of Module Elements				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemental
Performance Improvement Area 2: Globally Interoperable Systems and Data									
AMET	1. (Defined: Element 1) WAFS								X
	2. (Defined: Element 2) IAVW								X
	3. (Defined: Element 3) TCAC forecasts								X
	4. (Defined: Element 4) Aerodrome warnings	X							
	5. (Defined: Element 5) Wind shear warnings and alerts	X							
	6. (Defined: Element 6) SIGMET								
	7. (Defined: Element 6) Other OPMET information (METAR, SPECI and/or TAF)								X
	8. (Identified by NAT) QMS for MET								X
DATM	1. (Derived from 1.1.1) Aeronautical Information Exchange Model (AIXM)							X	
	2. (Derived from 3.1.3) eAIP							X	
	3. (Derived from 7.1) Digital NOTAM							X	
	4. (Identified by NACC) eTOD	X							
	5. (Identified by NAT) WGS-84								X
	6. (Identified by NAT) QMS for AIM								X
FICE	1. (Derived from 1.1.4) AIDC to provide initial flight data to adjacent ATSUs								X
	2. (Derived from 1.1.5) AIDC to update previously coordinated flight data							X	
	3. (Derived from 1.1.5) AIDC for control transfer	X							
	4. (Derived from 1.1.6) AIDC to transfer CPDLC logon information to the Next Data Authority							X	

PIA 3 Block 0 Module Elements Table

(with sample checks "X")

Block 0 Modules	Module Elements	Need Analysis of Module Elements				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 3: Optimum Capacity and Flexible Flights									
ACAS	1. (Derived from 1.3.2) ACAS II (TCAS version 7.1)	X							
	2. (Derived from 1.3.7 a) Auto Pilot/Flight Director (AP.FD) TCAS			X					
	3. (Derived from 1.3.7 b) TCAS Alert Prevention (TCAP)			X					
ASEP	1. (Defined: Element 1) ATSA-AIRB	X							
	2. (Defined: Element 2) ATSA-VSA	X							
ASUR	1. (Defined: Element 1) ADS-B							X	
	2. (Defined: Element 2) Multilateration (MLAT)							X	
FRTO	1: (Derived from Element 1) CDM incorporated into airspace planning								X
	2: (Defined: Element 2) Flexible Use of Airspace (FUA)								X
	3. (Defined: Element 3) Flexible route system								X
	4: (Derived from Element 3) CPDLC used to request and receive re-route clearances							X	
NOPS	1. (Derived from 1.1.1) ATFM								X
OPFL	1. (Derived from 1.3.1) ITP using ADS-B	X							
SNET	1. (Defined: Element 1) Short Term Conflict Alert implementation (STCA)							X	
	2. (Defined: Element 2) Area Proximity Warning (APW)	X							
	3. (Defined: Element 3) Minimum Safe Altitude Warning (MSAW)							X	
	4. (Identified by NACC) Medium Term Conflict Alert (MTCA)							X	

PIA 4 Block 0 Module Elements Table

(with sample checks "X")

Block 0 Modules	Module Elements	Need Analysis of Module Elements				Implementation Status (if Element is needed)			
		Not Started	In Progress	Need	N/A	Planning	Developing	Partially Implemented	Implemented
Performance Improvement Area 4: Efficient Flight Paths									
CCO	1. (Defined: Element 1) Procedure changes to facilitate CCO	X							
	2. (Defined: Element 1) Route changes to facilitate CCO	X							
	3. (Defined: Element 2) PBN SIDs	X							
CDO	1. (Derived from Element 1) Procedure changes to facilitate CDO	X							
	2. (Derived from Element 1) Route changes to facilitate CDO	X							
	3. (Derived from Element 2) PBN STARs	X							
TBO	1. (Defined: Element 1) ADS-C over oceanic and remote areas								X
	2. (Defined: Element 2) Continental CPDLC								X

The **No Country Left Behind** (NCLB) campaign highlights ICAO's efforts to assist States in implementing ICAO Standards and Recommended Practices (SARPs). The main goal of this work is to help ensure that SARP implementation is better harmonized globally so that <u>all</u> States have access to the significant socio-economic benefits of safe and reliable air transport.

Many "Analysis Not Started" is an indication of trouble.

ASBU – Metrics and Targets

Aerodrome based Element

Block 0 Modules	Elements	Metrics	Targets	Progress & Remarks
Performance Improvement Area 1: Airport Operations				
ACDM	1. Airport CDM procedures	a. Number of Table AOP I-1 aerodromes for which the need for this Element has been assessed = X. *Metric: X out of nn have been assessed* b. Number of assessed Table AOP I-1 aerodromes which need this Element = Y *Metric: Y out of X need this element* c. Number of needed implementations that have been completed = Z *Metric. Z out of Y have been completed*	**B0-ACDM 1 Target 1:** X= nn by December 2016	
	2. Airport CDM tools	a. Number of Table AOP I-1 aerodromes for which the need for this Element has been assessed = X. *Metric: X out of nn have been assessed* b. Number of assessed Table AOP I-1 aerodromes which need this Element = Y *Metric: Y out of X need this element* c. Number of needed implementations that have been completed = Z *Metric. Z out of Y have been completed*	**B0-ACDM-2 Target 1:** X= nn by December 2016	

ASBU – Metrics and Targets

ANSP based Element

Block 0 Modules	Elements	Metrics	Targets	Progress & Remarks
		Performance Improvement Area 2: Globally Interoperable Systems and Data		
AMET	1. WAFS	a. If the State has completed the need analysis for this Element = X *Metric: Yes if assessed; No otherwise* b. If the State needs this Element = Y *Metric: Yes if need this Element; No otherwise* c. If the State needs this Element and have completed implementation = Z *Metric: Yes if implemented; No otherwise*	**B0-AMET-1.Target 1** X=Yes by December 2016	
	2. IAVW	a. If the State has completed the need analysis for this Element = X *Metric: Yes if assessed; No otherwise* b. If the State needs this Element = Y *Metric: Yes if need this Element; No otherwise* c. If the State needs this Element and have completed implementation = Z *Metric: Yes if implemented; No otherwise*	**B0-AMET-2. Target 1** X=Yes by December 2016	

Put Together your ANP

- Consider adding ASBU section to the existing National ANP

- Consider Regional eANP Volume III

TABLE OF CONTENTS
Part 0 – Introduction
Part 1 – General Planning Aspects
Part 2 – Air Navigation System/ASBU
Implementation
Part 3 – Air Navigation System/Regional
Aviation System Improvement

National

Questions?

Thank you!
Midori.Tanino@faa.gov